CIVIL AIM CONSULTANTS & ENGINEERS

(Building Geo-Tech & Highway Materials Testing Laboratory)

An ISO 9001-2015 Certified Company

NABL Accredited As Per ISO/IEC 17025:2017 Laboratory

Job No.: CACE/BBMP/SC/W.No.15/2021-22

Date: 30.03.2022

TEST REPORT

CLIENT	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	:	**M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.
NAME OF THE WORK	:	Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
SAMPLE ID	:	Cement (Zuari OPC 53 Grade)
DATE OF MANUFACTURE		February - 2022
DATE OF TESTING		28.03.2022 to 30.03.2022
SAMPLES SUPPLIED BY	:	AGENCY

The results of the tests conducted on the cement sample are as follows:

Sl.No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 269-2015
1	a) Initial Setting Time	IS-4031 (Part -5)	120 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5)	330 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part 3) by the Le-Chatelier method	1 mm	Not more than 10 mm
3	Standard Consistency	IS-4031 (Part -4)	30.00 %	-

Note:

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For CIVIL AIM CONSULTANTS & ENGINEERS

Authorised Signatory

No.01, Satvika Nilaya, Opp. Widia Poorna Prajna School,
Ramaiah layout, Nagasandra, Bangalore - 560 073.
PH.No: 9591618639 GST IN:29CNWPD9510K1ZB Email:civilaimconsultants@...

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Job No.: CACE/BBMP/SC/W.No.15/2021-22

Date : 30.03.2022

TEST REPORT ON FINE AGGREGATES (SAND)

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.

Name of Work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.

Date of Testing : 30.03.2022

IS Code : IS 383:2016

: IS 2386 (Part 1):1963(RA 2011)

Material : Sand

Total Wt. of Aggregates in gms **1000**

Is Sieve Size in mm	Weight Retained (gm)	Retained Weight in %	Cumulative Retained Weight in %	Cumulative Weight Passing in %	Spec.Limits For Zone-II
10	0	0	0	100	100
4.75	89	8.90	8.90	91.1	90-100
2.36	124	12.40	21.30	78.7	75-100
1.18	182	18.20	39.50	60.5	55-90
600 Micron	156	15.60	55.10	44.9	35-59
300 Micron	250	25.00	80.10	19.9	8-30
150 Micron	132	13.20	93.30	6.7	0-10

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ಬಾಗಲಗುಂಟೆ. ಜಿ.ಪಿ.ಎಂ.ಸಿ
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Job No.: CACE/BBMP/SC/W.No.15/2022-23

Date: 15.04.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.

Name of the work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.

Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{15}

Compressive Strength as on : 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	08.04.2022	15.04.2022	8.132	262.8	11.68
2	08.04.2022	15.04.2022	8.146	279.5	12.42
3	08.04.2022	15.04.2022	8.155	256.3	11.39

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Job No.: CACE/BBMP/SC/W.No.15/2022-23

Date: 06.05.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.

Name of the work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.

Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{15}

Compressive Strength as on : 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	08.04.2022	06.05.2022	8.168	386.9	17.20
2	08.04.2022	06.05.2022	8.184	369.2	16.41
3	08.04.2022	06.05.2022	8.144	376.4	16.73

Note:

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date: 15.04.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.

Name of the work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.

Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{15}

Compressive Strength as on : 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	08.04.2022	15.04.2022	8.136	268.9	11.95
2	08.04.2022	15.04.2022	8.168	275.2	12.23
3	08.04.2022	15.04.2022	8.146	282.4	12.55

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date: 06.05.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.

Name of the work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.

Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{15}

Compressive Strength as on : 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	08.04.2022	06.05.2022	8.177	395.6	17.58
2	08.04.2022	06.05.2022	8.152	376.2	16.72
3	08.04.2022	06.05.2022	8.182	368.2	16.36

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date: 15.04.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.

Name of the work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.

Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{15}

Compressive Strength as on : 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	08.04.2022	15.04.2022	8.188	275.2	12.23
2	08.04.2022	15.04.2022	8.165	269.6	11.98
3	08.04.2022	15.04.2022	8.146	264.2	11.74

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date: 06.05.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.

Name of the work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.

Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{15}

Compressive Strength as on : 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	08.04.2022	06.05.2022	8.188	376.3	16.72
2	08.04.2022	06.05.2022	8.164	368.2	16.36
3	08.04.2022	06.05.2022	8.149	384.6	17.09

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date: 18.04.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.

Name of the work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.

Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{15}

Compressive Strength as on : 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	11.04.2022	18.04.2022	8.135	266.9	11.86
2	11.04.2022	18.04.2022	8.144	279.5	12.42
3	11.04.2022	18.04.2022	8.158	285.2	12.68

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date: 09.05.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.

Name of the work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.

Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{15}

Compressive Strength as on : 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	11.04.2022	09.05.2022	8.166	380.3	16.90
2	11.04.2022	09.05.2022	8.184	369.3	16.41
3	11.04.2022	09.05.2022	8.176	376.2	16.72

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date: 18.04.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.

Name of the work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.

Sample ID : Cement Concrete

Size of cubes : 150mmx150mmx150mm

Cross Sectional Area : 22500 mm^2

Technical Reference : IS: 516-1959 (Reaffirmed 2008)

Grade of Concrete : M_{15}

Compressive Strength as on : 7th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	11.04.2022	18.04.2022	8.177	269.2	11.96
2	11.04.2022	18.04.2022	8.182	276.5	12.29
3	11.04.2022	18.04.2022	8.164	282.4	12.55

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ಬೆಂಗಳೂರು-೫೬೦೦೭೩.

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date: 09.05.2022

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

Client	: **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.
Name of the work	: Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
Grade of Concrete	: M_{15}
Compressive Strength as on	: 28th day

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	11.04.2022	09.05.2022	8.178	389.6	17.32
2	11.04.2022	09.05.2022	8.168	368.2	16.36
3	11.04.2022	09.05.2022	8.177	376.2	16.72

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Job No.: CACE/BBMP/SC/W.No.15/2022-23

Date: 20.04.2022

KERB STONE (CORE) TEST REPORT

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	**M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.
Name of Work	:	Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
No.of Sample Tested	:	03
Date of Testing	:	20.04.2022
Techinical Reference	:	IS:516-1959 (Reaffirmed 1999), SP-24:1983.
Grade of Concrete	:	M_{15}

Sl. No:	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	50.00	72.00	0.329	2327.20	1.44	0.940	24.90	12.68	13.70	12.87	16.08
2	50.00	74.00	0.343	2360.65	1.48	0.944	25.60	13.04	14.08	13.29	16.61
3	50.00	76.00	0.357	2392.35	1.52	0.948	26.90	13.70	14.80	14.03	17.54

Note:

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ಬೆಂಗಳೂರು-560073.

Authorised Signatory

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Job No.: CACE/BBMP/SC/W.No.15/2022-23

Date: 20.04.2022

PRECAST SLAB 100mm Thick(CORE) TEST REPORT

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Contractor	:	**M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.
Name of Work	:	Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
No.of Sample Tested	:	03
Date of Testing	:	20.04.2022
Techinical Reference	:	IS:516-1959 (Reaffirmed 1999), SP-24:1983.
Grade of Concrete	:	M_{20}

Sl. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	50.00	81.00	0.372	2338.99	1.62	0.959	32.30	16.45	17.77	17.04	21.30
2	50.00	83.00	0.383	2350.12	1.66	0.963	33.40	17.01	18.37	17.70	22.12
3	50.00	85.00	0.398	2384.70	1.70	0.968	34.20	17.42	18.81	18.20	22.75

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date : 25.04.2022

GRADATION FOR WMM

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.

Name of Work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.

IS Code: : IS 2386 (Part 1):1963(RA 2011)

Date of Testing : 25.04.2022

Material Type : Wet Mix Macadam

Oven Dry.Wt, grar 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Requirement as per MORTH 5th edition table no 400.13
53	0	0	0	100	100
45	172	172	1.7	98.3	95-100
22.4	2430	2602	26.0	74.0	60-80
11.2	2158	4760	47.6	52.4	40-60
4.75	1830	6590	65.9	34.1	25-40
2.36	1165	7755	77.6	22.5	15-30
0.600	543	8298	83.0	17.0	8-22
0.075	1368	9666	96.7	3.3	0-5

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Job No.: CACE/BBMP/SC/W.No.15/2022-23

Date: 25.04.2022

Aggregate Impact Value

Client	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.
Name of the Work	Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
IS Code	IS 2386 (Part 4):1963(RA 2011)
Type of Mix	Wet Mix macadam
Date of Testing	25.04.2022

Sl No.	Details	Test No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	380	382	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	296	296	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.11	22.51	**22.31**

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%(As per MORTH Specication table 400.12)

Note:

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date : 25.04.2022

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.
Name of Work	Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
BIS code:	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	25.04.2022

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 400.12
1	Flakiness Index %	11.20	11.50	Combined Flakiness & Elongation index Max 35%
2	Elongation Index %	12.50	12.90	
	Combined Flakiness & Elongation index	23.70	24.40	

Note:

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date : 27.04.2022

ATTERBERG LIMITS TEST FOR WMM

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.

Name of Work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.

IS Code: : IS 2720(Part 5):1985

Date of Testing : 25.04.2022 to 27.04.2022

Material Type : Wet Mix Macadam

Sl. No.	Particulars	Test Results	Requirement as per MORTH 5th edition Cl.406.2.1.2
1	Liquid Limit	19.50	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date: 02.05.2022

Aggregate Gradation Test

Client	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	M/s. Srusti Constructions (Prop. Siddappa), Contractor, Bangalore.
Name of the Work	Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963(RA 2011)
Sample I / D	Hot mix Plant, Bangalore.
Type of Mix	Dense Graded Bituminous Macadam
Date of Testing	02.05.2022

Total Weight of Sample: 10000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.50	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.50	715	7.2	7.15	92.85	90 - 100	
19.00	1250	12.5	19.65	80.35	71 - 95	
13.20	1385	13.9	33.50	66.50	56 - 80	
4.75	2510	25.1	58.60	41.40	38 - 54	
2.36	1085	10.9	69.45	30.55	28 - 42	
0.300	1316	13.2	82.61	17.39	7 - 21	
0.075	1152	11.5	94.13	5.87	2 - 8	

Total Weight of Sample: 10000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.10	Remarks
37.5	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
26.5	679	6.8	6.79	93.21	90 - 100	
19	1420	14.2	20.99	79.01	71 - 95	
13.2	1150	11.5	32.49	67.51	56 - 80	
4.75	2416	24.2	56.65	43.35	38 - 54	
2.360	1160	11.6	68.25	31.75	28 - 42	
0.300	1328	13.3	81.53	18.47	7 - 21	
0.075	1156	11.6	93.09	6.91	2 - 8	

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Job No: CACE/BBMP/SC/W.No.15/2022-23 Date : 02.05.2022

TEST RESULTS OF AGGREGATE IMPACT VALUE

Client : **Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency : **M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.
Name of work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
Source / Location : Hot Mix Plant, Bangalore
BIS Code : IS 2386 Part (4):1963
Type of Mix : Dense Graded Bituminous Macadam
Date of test : 02.05.2022

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W1 g	383	385	
2	Weight of agregate passing 2.36 mm sieve after the test = W2 g	84	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W3 g	299	299	
5	Aggregate Impact value = percent fines 100* (W2/W1) percent	21.93	22.34	**22.13**

Comments:
→ Maximum allowable Aggregate Impact value for Dense Graded Bituminous Macadam is 27% (Table 500-8 of MORTH specification)

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JobNo: CACE/BBMP/SC/W.No.15/2022-23 Date : 02.05.2022

TEST RESULTS OF AGGREGATE SHAPE TEST
(Flakiness & Elongation)

Client : Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.

Agency : M/s. Srusti Constructions (Prop. Siddappa), Contractor, Bangalore.

Name of work : Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.

BIS Code : IS 2386 Part (1):1963

Date of Test : 02.05.2022

Type of Mix : Dense Graded Bituminous Macadam

Sl.No.	Flakiness Index Value(%)	Elongation Index Value(%)	Total(Combined Flakiness and Elongation)(%)	Requirements
1	11.30	13.80	25.10	Maximum allowable Combined Flakiness and Elongation Indices for Dense Graded Bituminous Macadam is 35% as per Table 500.8 MORTH Specification.
2	11.90	14.10	26.00	

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Job No.: CACE/BBMP/SC/W.No.15/2022-23

Date : 03.05.2022

Aggregate Gradation Test
IS : 2386 Part I

Client	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	M/s. Srusti Constructions (Prop. Siddappa), Contractor, Bangalore.
Name of the Work	Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
BIS Code	IS 2386(Part 1):1963
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	03.05.2022

Total Weight of Sample: 5000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	410	8.20	8.20	91.80	90 - 100	
9.5	489	9.78	17.98	82.02	70 - 88	
4.75	632	12.64	30.62	69.38	53 - 71	
2.36	688	13.76	44.38	55.62	42 - 58	
1.18	524	10.48	54.86	45.14	34 - 48	
0.600	542	10.84	65.70	34.30	26 - 38	
0.300	482	9.64	75.34	24.66	18 - 28	
0.150	356	7.12	82.46	17.54	12 - 20	
0.075	486	9.72	92.18	7.82	4 - 10	

Total Weight of Sample: 5000 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Requirement as per MORTH table 500.17	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade-II specification as per MORTH
13.2	432	8.64	8.64	91.36	90 - 100	
9.5	542	10.84	19.48	80.52	70 - 88	
4.75	688	13.76	33.24	66.76	53 - 71	
2.36	530	10.60	43.84	56.16	42 - 58	
1.18	553	11.06	54.90	45.10	34 - 48	
0.600	549	10.98	65.88	34.12	26 - 38	
0.300	689	13.78	79.66	20.34	18 - 28	
0.150	185	3.70	83.36	16.64	12 - 20	
0.075	489	9.78	93.14	6.86	4 - 10	

Note:

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Job No.: CACE/BBMP/SC/W.No.15/2022-23

Date: 03.05.2022

Aggregate Impact Value

Client	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
Agency	M/s. Srusti Constructions (Prop. Siddappa), Contractor, Bangalore.
Name of the Work	Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
BIS Code	IS 2386(Part 4):1963
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	03.05.2022

Sl No.	Details	Test No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	379	381	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	87	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	294	294	
4	Aggregate Impact value = percent fines 100* (W_2/W_1) percent	22.43	22.83	22.63

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%(MORTH table no.500.16)

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date: 03.05.2022

TEST REPORT

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	**M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.
Name of the work	:	Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
IS Code	:	IS 73:2013, IS 1203:1978(RA 2008), IS 1205:1978(RA 2009), IS 1208:1978(RA 2009), IS 1209:1978(RA 2009)
Source of location	:	Hot mix Plant, Bangalore, VG 30
Date of testing	:	03.05.2022

The results of the tests conducted on the bitumen sample using for Bituminous Concrete

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	49	Min 45
2	Softening point, ^{0}C	52	Min. 47
3	Ductility at 27^{0}C, cm	> 100	Min. 40
4	Flash Point, ^{0}C	270	Min. 220

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date : 03.05.2022

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.
Name of Work	Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Concrete
Date of Testing	03.05.2022

Sl no	Test	1	2	Requirements as per MORTH 5th edition table no 500.16
1	Flakiness Index	11.2	11.6	Combined Flakiness & Elongation index Max 35%
2	Elongation Index	12.9	13.2	
	Combined Flakiness & Elongation index	24.10	24.80	

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Ref No.: CACE/BBMP/SC/W.No.15/2022-23 Date : 05.05.2022

Specific Gravity And Water Absorption Test

Client	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.
Name of the Work	Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
BIS Code	IS 2386(Part 3):1963
Type of Mix	Bituminous Concrete
Date of Testing	03.05.2022 to 05.05.2022

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	$W_1 g$	2022	2024	2026	
2	Weight of basket suspended in water	$W_2 g$	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s g$	1267	1269	1271	
4	Weight of saturated surface dry aggregate in air	$W_3 g$	2017	2019	2021	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S) g$	750	750	750	
6	Weight of oven dried aggregate	$W_4 g$	2011	2012	2013	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.681	2.683	2.684	2.683
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.703	2.708	2.713	2.708
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.30%	0.35%	0.40%	0.35%

Comments:
→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%(MORTH table 500.16)

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Job No.: CACE/BBMP/SC/W.No.15/2022-23 Date: 10.05.2022

TEST REPORT ON STABILITY OF MIX

Client	:	**Assistant Executive Engineer,** Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	**M/s. Srusti Constructions (Prop. Siddappa),** Contractor, Bangalore.
Name of the Work	:	Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	10.05.2022

The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	10.12	9.68	9 Kn (min)
2	Marshal flow, mm	2.55	3.44	2 – 4
3	Percent air voids in Mineral Aggregate	13.79	14.21	13 – 15
4	Voids in Compacted Mix	3.93	5.56	3 – 6
5	Percent Voids filled with Bitumen	67.46	68.12	65 - 75
6	Density, g/cc	2.25	2.26	--

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Job No: CACE/BBMP/SC/W.No.15/2022-23 Date : 10.05.2022

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

AASHTO T 164 & AASHTO T 30

CLIENT	Assistant Executive Engineer, Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	M/s. Srusti Constructions (Prop. Siddappa), Contractor, Bangalore.
NAME OF THE WORK	Improvements and re asphalting Pipeline SM Road to S Ramesh Road in Dasarahalli Ward No.15, BBMP, Bangalore.
SAMPLE ID	Hot Mix Plant, Bangalore
DATE OF TESTING	10.05.2022

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	472.5	473
3. Weight of Asphalt and Mineral matter Extracted, g	27.5	27
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	27.5	27
7. Bitumen content in %	5.50	5.40
8. Average	5.45	

GRADATION AFTER EXTRACTION

SIEVE SIZE mm	Test 1 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	15.6	15.6	3.3	96.7	90 - 100
9.5	65.8	81.4	17.2	82.8	70 - 88
4.75	90.3	171.7	36.3	63.7	53 - 71
2.36	40.5	212.2	44.9	55.1	42 - 58
1.18	33.8	246	52.1	47.9	34 - 48
0.600	53.6	299.6	63.4	36.6	26 - 38
0.300	46.9	346.5	73.3	26.7	18 - 28
0.150	38.9	385.4	81.6	18.4	12 - 20
0.075	52.4	437.8	92.7	7.3	4 - 10

SIEVE SIZE mm	Test 2 Weight Retained, gm	Cummulative Weight Retained	%Cummulative Retained	% Passing	Requirement as per MORTH table 500.17
19	0	0	0	100	100
13.2	14.9	14.9	3.2	96.8	90 - 100
9.5	66.3	81.2	17.2	82.8	70 - 88
4.75	92.4	173.6	36.7	63.3	53 - 71
2.36	45.8	219.4	46.4	53.6	42 - 58
1.18	40.6	260	55.0	45.0	34 - 48
0.600	53.2	313.2	66.2	33.8	26 - 38
0.300	48.9	362.1	76.6	23.4	18 - 28
0.150	33.6	395.7	83.7	16.3	12 - 20
0.075	46.2	441.9	93.4	6.6	4 - 10

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